

Horse Shoe and Medical Composition

The present invention relates to horse shoes and in particular to removable horse shoes which are retained on the hoof of an animal by means other than nailing, as well as to a composition for use as a medicament, in particular for treating animal hooves

It is well known that exercising horses on hard surfaces causes excessive wear to the animal's hooves, and it is therefore common practice to attach shoes to horses' hooves to reduce damage resulting from such exercising animals on roads etc. Even in circumstances where the animals are not being exercised on hard surfaces and hence wear to the hooves should not be a problem, for example horse racing on grass surfaces, it is still common practice to shoe animals in order to improve the animals grip and hence avoid possible injury from the animal slipping during a race. Indeed, special race shoes have been developed which are of a lighter weight to prevent handicapping of a particular animal, and also, in some cases, which include studs or the like to further improve grip in particularly damp conditions.

The form of such horse shoes for use when an animal is exercising has changed little over the centuries and typically comprise a metal band which is forged into a generally 'U' shape and fastened to the animal's hoof by nailing. Whilst these shoes are, as stated above, primarily applied to protect the animal's hooves, the nails which are used to hold them in place themselves cause a significant amount of damage – indeed it has been suggested that a majority of lameness in horses is a result of the nails which are driven into their feet in order to attach the horse shoes. Such damage is exacerbated in racing animals on which the aforementioned lightweight racing shoes are used during races. These racing shoes are typically made of materials such as aluminium which, although light, are soft and therefore wear very quickly. Typically, then, the racing shoe is applied at most a day before a race and removed as soon as possible after the race is completed and replaced with a better wearing but heavier type of shoe. Such constant changing of the shoe requires nails repeatedly to be removed from and reinserted into the animal's

hoof, causing further damage to the wall of the horse's foot each time. Indeed, it is not unusual, over a period of time, for the hoof to become so damaged that whole sections of the wall of the hoof simply fall out, requiring the hoof artificially to be reconstructed using epoxy resin or the like so that a shoe can again be attached.

A further problem with conventional horse shoes is that, unless fitted properly, they can reduce the blood flow through the animal's leg. On the underside of the hoof of a horse is a projection commonly called the frog. When a horse puts its foot to the ground, pressure is applied to the frog which assists in pumping blood back up the leg of the animal. However, due to the U shaped formation of a horse shoe, the frog is elevated from the ground on a shoed hoof, reducing the pressure applied thereto as a horse walks, and hence reducing the pumping action thereof.

Horse shoes are also known which take the form of a boot that encloses the whole hoof rather than just being attached to the underside thereof, such shoes typically being attached to the hoof by means of a strap which passes around the ankle of the animal just above the bulb. These shoes are, however, used exclusively for therapeutic reasons and are designed to be a very loose fit on the hoof – their loose fit and single strap retention system means that they are quickly thrown from the animal's foot during exercise.

According to the present invention there is provided a horse shoe comprising a sole member, a front panel which is connected to and extends upward from the front of said sole so as, in use, to enclose the front of the hoof of an animal, a back panel which is connected to and extends upwards from the back of said sole so, in use, to extend around the back of the hoof of an animal, a front strap assembly which extends obliquely on both sides of the shoe between a rear portion of the base and said front panel, and a rear strap assembly which extends obliquely on both sides of the shoe between a front portion of the base and said back panel.

A horse shoe in accordance with the invention has the advantage that the strap configuration is secure enough to ensure that the shoe does not move on nor is thrown from the animals hoof during even the most strenuous exercise such as during a horse race whilst, at the same time, avoid the need to any intrusive fastening means such as nails or the like, thereby avoiding damaging the animal's hoof during attachment or removal. The arrangement of the front strap assembly ensures that the front of the shoe is held back and down onto the foot, whilst, at the same time, the rear strap assembly lifts and holds the heel of the shoe up to the foot, thereby ensuring a good and reliable fit of the shoe on the animal in all conditions and foot positions.

Furthermore, the construction facilitates quick fitting and removal, maximising the time during which the animal's foot can be left in its natural, un-shod, state, which is most conducive to an animal with healthy hooves.

Preferably, the horse shoe further includes resiliently deformable side panels which extend between said front and back panels on either side of the shoe. These resiliently deformable side panels enable the front and back panels of the shoe to be stretched apart during fitting, thereby facilitating the placement of the shoe on the hoof of the animal whilst still maintaining a tight fit once the shoe is in place. Furthermore, by connecting the front and back panels separately to the sole of the shoe and not connecting them directly to each other, the back panel is able to pass inside the front panel as the sole bends during use, thereby enabling the shoe uniquely to adjust to every angle adopted by the foot of the animal during exercise. Suitable materials for the side panels might be elastic, neoprene, rubber or the like.

Preferably, the inner side of the base member, which in one embodiment forms an innersole of the shoe, is made from a memory retaining material which moulds to the shape of the underside of the foot or hoof. It has been found that EVA foam is particularly good for this purpose. In this way, a particularly comfortable fit of the shoe on the particular animal is achieved. The innersole may alternatively be formed as a

separate insert member which extends along the inner surface of the base member and upwards along the inner surface of the back panel. The innersole also preferably has two frog supports formed thereon which support each side of the frog. This has the advantage of assisting grip given to the base of the foot or hoof, and also assists in ensuring that the frog operates to provide proper circulation in the legs of the animal. Preferably, the frog supports are lanceolate leaf shaped and are positioned symmetrically on either side of the centre line of the shoe with their major axes inclined towards each other towards the front of the shoe. This results in a particularly effective engagement with the tapering sides of the forwardly pointing 'V' shaped frog of the horse's hoof.

The front and rear strap assemblies are preferably each composed of a pair of straps, one end of each said strap being permanently attached to the respective portion of the sole of the shoe and the other end being fastenable to the respective front or back panel by means of anchoring means provided on said panels proximate to the upper edge thereof. More particularly, each of the front and back panels may include a pair of buckles, positioned symmetrically on each side of the shoe to which the straps attach. In the preferred embodiment, the front buckles are attached to opposite ends of a front anchor strap which is attached to the front panel proximate to the ankle opening of the shoe and which extends transversely across the centreline of the shoe, and the back buckles are attached to opposite ends of a back anchor strap which is fastened to the back panel proximate to the ankle opening of the shoe and which extends around the back of the shoe transversely of the centre line. The fastening of the straps to the buckles may be achieved in a number of well known ways, but it has been found to be particularly effective if each strap is provided on its outer surface with a first hook and loop fastening material along a first portion of its length extending from its free end and a second hook and loop fastening material, complementary to said first material, along a second portion of its length extending from said first portion towards said sole. Each strap is then fastened by threading it through its associated buckle and folding it back onto itself, interaction of the two materials securing the strap to itself.

The buckle configuration for the front straps may, however, be reversed so that the front strap buckles are instead fastened on the ends of straps proximate to rear portion of the base, in particular to opposite ends of a rear base strap which extends from one side of the back of the shoe, under the heal portion of the base to the other side of the back of the shoe. The fastening strap then extends across the bridge of the front of the show and obliquely down either side towards the buckles located proximate to the base panel at the back of the shoe. In each case, the fastening straps and buckle anchoring straps may extend across the outer surface of the front, back and base panels, or may pass through slots formed in said panels and extend along the inner surfaces thereof.

The provision of anchoring buckles is not, essential to the invention, and, instead, fastening may be achieved, for example, by providing hook and loop material on the inner surface of the straps and on the outer surface of the front and back panels in a well known manner.

Instead of being attached to the front and back panels, the straps may instead attached directly to each other across the front and back panels respectively so as to provide the necessary clamping force. In this embodiment, however, it is advantageous to provide guide means on the front and back panels to ensure that the straps lie on said panels in positions to optimise their effectiveness in retaining the shoe on the hoof of the animal.

The sole is preferably composed of a plurality of layers which are sandwiched together, and, in an advantageous development, has a suitable tread pattern applied to its lower surface. Straps to form the front and rear strap assemblies are then advantageously integrally formed with one of the layers of the sole, preferably an intermediate inner sole layer. This has the advantage of ensuring a particularly secure and reliable connection between the sole of the shoe and the straps.

Advantageously, the inner surface of the front panel or horn cover has a gripping property, which may be achieved by suitable finishing of the material of the panel or by

applying a separate material to the surface thereof. This has the advantage that the horn of the hoof is gripped by the front panel, thereby preventing any twisting or forward movement of the hoof within the shoe.

The inner surface of the back panel is also preferably shaped to complement the shape of the back of the hoof of a typically animal so as to ensure a comfortable and tight fit on the hoof, and may also be provided with a gripping surface to further improve the grip of the back panel on the heel of the hoof.

In an alternative embodiment, a removable outer sole may be attachable to the base panel of the shoe, which outer shoe in a particularly preferred embodiment has front and rear panels which, when fitted onto shoe, overlap the front and rear panels of the shoe so as to assist in fastening the outer sole in place. The outer sole may also have side sections which extend between the front and rear panels and which, when the outer sole is fastened to a shoe, overlap the sides of the shoe. This arrangement has the advantage that the tread is provided on the outer surface of the outer sole, and hence different tread patterns may be provided for different uses by fitting different outer soles onto a generic shoe.

The shoe may be formed from a number of materials. However, it has been found to be preferable for the bottom of the sole and the back panel to be formed of rubber, the front and back of the sole which folds up to form the toe and heel cap similarly being formed of rubber, and for the front panel and inner sole to be formed from EVA foam.

The shoe of the invention may also be used for medical purposes. In this arrangement, the resiliently deformable side panels may be replaced by side extension panels provided on each side of the front and rear panels, which the front and rear side extension panels on each side overlapping so as to fully enclose the hoof within the shoe when straps are fastened together. This has the advantage that, since the rear panel is connected to the front panel only via the base panel, the rear panel can be opened out by folding away

from the front panel so as to lie parallel to the base panel, thereby facilitating engagement of the horses hoof into the shoe.

In the medical shoe, the inner sole may be replaced by a gauze pad to treat a foot injury, or such a gauze may be formed separately from and be insertable into the shoe, this having the advantage that it can easily be applied by a lone person whereas the present practice of utilising a bag and bandages to retain a gauze on the hoof is time consuming to apply and normally requires two people. Such medical treatments are normally applied for a relatively short period of no more than 48 hours, and the animal will not be exercised during that period. Accordingly, a shoe for this purpose may be made of less robust material and it has been found to be particularly advantageous when making such a shoe to use EVA foam for the front and back panels as well as the outer sole.

In an alternative embodiment, the sole of the shoe extends upwards along the inside of the front panel so as to form a tongue for the shoe. This has the advantage of providing extra strength to the toe of the shoe, and has been found to particularly effective for medical applications of the shoe. In such medical shoes, it is also preferably for the sole not to extend upwards at the rear of the shoe.

In such medical applications, the shoe may be used to apply a medicinal paste to the hoof of the animal. This is achieved by first thoroughly cleaning the hoof and then applying a suitable medical paste to the whole area of the sole of the hoof, including the frog. The medical or poultice boot according to the present invention is then fitted to the hoof and the straps tightened. Preferably, the boot is then taped over with an adhesive bandage in order to prevent the ingress of dirt.

The present invention further, then, provides a composition comprising 95% to 99% Glycerine, 3 to 8 g/kg of *Lavendula angustifolia* x *latifolia*, 0.5 to 1.5 g/kg *Arnica Montana* and 1.5 to 10 g/kg *Melaleuca alternifolia* for use as a medicament, as well as use of such a composition for the manufacture of a medicament for animal hooves. It

has been found that a composition comprising 99% Glycerine, 0.6% *Lavendula angustifolia* x *latifolia*, 0.1% *Arnica Montana* and 0.3 % *Melaleuca alternifolia* is particularly effective for treating ailments to animal hooves, in particular horses hooves.

In order that the invention may be well understood, there will now be described some embodiments thereof, given by way of example, reference being made to the accompanying drawings, in which:

Figure 1 is a left side view of a horse shoe according to the invention;

Figure 2 is a front view of the horse shoe of Figure 1;

Figure 3 is a right side view of the horse shoe of Figure 1;

Figure 4 is a plan view of a part of the sole of the horse shoe of Figure 1 to which front and rear straps are attached;

Figure 5 is a plan view of the horse shoe of Figure 1;

Figures 6a to 6c and bottom, front and side views of an outer sole for use with the horse shoe of Figure 1;

Figures 7a to 7c are top, front and side views of an inner sole for use with the horse shoe of Figure 1;

Figures 8a to 8d are side views of the separate horse shoe, inner sole and outer sole as well as of the shoe fully assembled with the inner and outer soles;

Figures 9a to 9c are front views of the separate horse shoe, and outer sole as well as of the shoe fully assembled with the outer sole;

Figures 10a to 10c are rear views of the separate horse shoe, and outer sole as well as of the shoe fully assembled with the outer sole;

Figures 11a to 11c are top views of the separate horse shoe, and outer sole as well as of the shoe fully assembled with the and outer sole; and

Figure 12 is a partially cut away side view of a second embodiment of a horse shoe according to the invention.

Referring first to Figure 1, there is shown a horse shoe 1 embodying the invention which has a sole 2 that is sized and shaped generally to match the general size and shape of the base of the hoof of an animal, which inclines upwards at the front 3 and rear 4 to form a toe cap 3 and a heel cap 4, and on the bottom surface of which may be formed a suitable grip or tread pattern. A conventional metal shoe may also be attached to the bottom of the sole 2 to provide improved grip. Attached around the front edge of the sole 2 is a front panel 5 which forms a horn cover. The horn cover 5 is inclined to the sole 2 and extends upwards therefrom in a generally rearward direction. It is furthermore curved to complement the curvature of the front or horn of the hoof of the animal with which it is to be used and the top edge 6 is shaped to provide a comfortable engagement with the front of the ankle of the animal. The inner surface of the horn cover 5 is furthermore finished so as to have a gripping property which holds onto the front surface of the hoof so as to help to prevent any twisting or forward movement of the hoof in the shoe.

Attached around the rear edge of the sole 2 is a back panel 8 which extends generally vertically from the sole 2 and forms a heel or bulb support. The horn cover 5 is again curved to complement the general shape of the rear or bulb of the foot. In particular, as shown in Figure 5, the inner surface of the bulb support 8 has a pair of depressions 10a, 10b formed therein which engage with the two protrusions on the back of the foot of the animal and hence ensure both a tight and a comfortable fit on the hoof. As with the horn cover 5, the top edge of the bulb support is also shaped to provide a comfortable but tight fit with the back of the ankle of the animal.

As can be seen from the drawings, the sides of the front and back panels 5, 8 are attached separately to the sole 2 of the shoe 1 – they are not directly joined to each other. Instead, as best shown in Figures 1 and 3, the front and back panels 5, 8 are separated on each side of the shoe by a web of elastic material 11, 12. These elastic side panels 11, 12 pull said front 5 and back 8 panels towards each other so that, in use, they tightly engage the horn and bulb respectively of the hoof whilst allowing the top opening 14 of the shoe 1 to

be expanded by pulling the front and back panels 5, 8 part to stretch the side panels 11, 12 and hence facilitate fitting of the shoe onto the hoof of the animal. Furthermore, because the rigid front and back panels are not directly joined to each other, the rear panel 8 is able to pass on the inside of the front panel 5 as the heel of the sole is lifted from the ground, thereby enabling the shoe uniquely to adjust to every position adopted by the foot during movement on the front, length and width of the shoe.

In order to secure the hoof within the shoe, front and rear straps are provided which are attached to the sole 2. In the preferred embodiment, the sole 2 is formed of two or more layers, one of which 20 has four straps integrally formed therewith as shown in Figure 4, two back straps 21a, 21b which extend from the back of the sole 2 and two front straps 22a, 22b which extend from the front of the sole 2. The back straps 21a, 21b are shaped so as to extend diagonally forwards and upwards along each side of the shoe and fasten to respective front buckles 23a, 23b mounted symmetrically on either side of the front panel 5 proximate to the top thereof. In the illustrated embodiment, the front buckles 23a, 23b are attached to either end of a front anchor strap 24 which extends transversely across the bridge of the front panel 5 and is attached thereto by suitable means such as stitching or gluing. However, the front buckles 23a, 23b may instead be attached to separate front anchor straps or, indeed, may be directly fastened to the front panel 5.

The front straps 22a, 22b are similarly shaped to extend diagonally upwards and rearwards along either side of the shoe 1, so that, in use, the front strap will cross the back strap on each side or vice versa, and associated rear fastening buckles 25a, 25b are provided symmetrically on each side of the back panel 8 proximate to the top thereof for fastening of the front straps 22a, 22b on each side of the shoe as shown in Figures 1 and 3. As with the front buckles, the rear buckles 25a, 25b are attached to either end of a rear anchor strap 26 in the illustrated embodiment, which extends transversely across the top of the back panel 8 and is attached thereto by suitable means such as stitching or gluing. The rear buckles 25a, 25b may again instead be attached to separate rear anchor straps or, indeed, may be directly fastened to the back panel 8.

The actual fastening between the straps 21a, 21b, 22a, 22b and their respective buckles 23a, 23b, 25a, 25b may be achieved in any well known fashion. It has, however, been found particularly to facilitate fitting and removal of the shoe if the straps are provided with hook and loop fastening material on their outer surface and, in use, are each looped through their respective buckle and then folded back so as to fasten onto themselves in a well known manner. Such an arrangement enables the shoe to be properly tightened very easily due to the leverage afforded to the fitter when a strap has been looped through its buckle.

In an embodiment of the invention not illustrated, the buckles are omitted altogether and the front and rear anchor straps are instead provided with hook and loop or similar fastening material on their outer surfaces, each of the front and rear straps being provided with complementary hook and look material on their inner surfaces so that the straps are simply pressed against the anchor straps to fasten them thereto.

In order to ensure that the hoof is properly positioned in the shoe, a pair elongated protrusions 30a, 30b are provided on the innersole, positioned symmetrically on either side of the centre line of the sole 2. As shown in Figure 5, which, in use, support the frog of the hoof when properly fitted. In the illustrated embodiment, these frog supports 30a, 30b are lanceolate leaf shaped with their major axes inclined towards each other towards the front of the shoe so that they engage against the inclined sides of the forward pointing, generally V shaped frog of a typical horses hoof. Other designs of Frog support are also possible within the scope of the invention.

The outer sole 2 is preferably formed of rubber as is the back panel 8, whereas the front panel 5 and the innersole are preferably formed of EVA foam. The shoe may also, however, be used for medical purposes in which case the innersole is replaced by a medical gauze and the front and rear panels and sole may all then be formed of EVA foam.

The inner and outer soles may be integrally formed with the shoe. However, the inner and outer soles may also be formed as separate parts to the main shoe 1 which are fitted to the shoe to meet the particular use. Figures 6a to 6c show various views of a detachable outer sole 50 which may be used with the shoe of the invention. The outer sole 50 has a suitable tread pattern 51 formed on its base, which pattern may be varied to suit different applications for the shoe such as flat racing, steeple chase, jumping etc. The outer sole 50 also has front 52 and rear 53 panels which extend upwardly of the main section of the sole so that, when fitted onto the shoe, the front panel 52 partially overlaps the front panel or horn cover 5 of the shoe, and the rear panel 53 partially overlaps the rear panel 8 of the shoe as shown in Figure 8d. The shoe thereby is enclosed within the outer sole 50 and hence the two parts of firmly held together, although suitable additional fastening means such as adhesive or the like may be provided between the outer surface of the base of the shoe and the inner surface of the base of the outer sole 50.

A separate removable inner sole 60 such as illustrated in Figures 7a to 7c may also be used with the shoe 1 of Figure 1. This inner sole 60 has integrally formed base panel 61 and rear panel 62 with each being suitably moulded to complement the shape of the base and rear of the animal hoof. In particular, the base panel 61 may include projections which are complementary to the shape of and engage with the frog of the hoof to facilitate correct positioning of the shoe on the hoof and also to ensure comfort to the animal. The inner sole 60 then engages within the shoe 1 with the base panel 61 engaging with the base of the shoe 61 and the rear panel 62 of the inner sole 60 overlying the inner surface of the rear panel 8 of the shoe 1. Suitable releasable fastening means such as hook and loop material or the like may be provided on the engaging surfaces to retain the inner sole 60 in position within the shoe 1.

Figure 12 shows an alternative embodiment of the shoe 1' of the invention which is particularly advantageous for medical applications. The key difference between the shoe of figure 6 and that of figures 1 to 5 is in the configuration of the sole 2'. As can clearly be seen in Figure 12, the sole 2' does not extend upwards at the back 8' of the shoe as

with the first embodiment. Furthermore, the sole 2' extends upwards at the front of the shoe and substantially along the horn cover 5' so as to form a tongue 40 in the shoe. This gives extra strength to the toe of the shoe and also more gently treats the horn of the animal's hoof. Furthermore, no resiliently deformable side panels are provided between the front and back panels of the shoe of Figure 12. Instead, the front panel 5' has integrally formed flaps 61 which extend rearwardly from the front panel 5 along the sides of the shoe, and the rear panel 8' has integrally formed flaps 62 which extend forwardly from the rear panel 8' along the sides of the shoe. These front and rear flaps 62 are size so as to overlap longitudinally and hence, when the shoe is fitted onto hoof of an animal, the hoof is completely enclosed therein on all sides.

As illustrated in Figure 12, the front and rear buckles are provided on the ends of the front strap which extends across the top of the horn and the rear strap which extends around the top of the rear panel of the shoe. In an alternative embodiment shown in Figure 13, however, the buckles 70 for the front strap 71 are located on either side of the shoe towards the rear and bottom of the shoe and are fastened onto the ends of the strap which extends around the bottom of the heel of the shoe. In this way, the front strap is tightened by pulling upwards from the sole, which has been found to facilitate better tightening. Although not illustrated, the buckles for the rear strap may similarly be located on the strap which extends under the front of the shoe.

Although in the above described embodiments a single strap extends from one side of the shoe to the other, the straps on each side of the shoe may be formed separately to each other, with each being attached to the front panel, rear panel and sole as appropriate. Alternatively, straps may be integrally formed with the front and/or rear panel and/or the sole.

Because the medical shoe will not be worn by an animal during exercise, it does not need to be as robust as the shoe of Figures 1 to 5. Preferably, then, the back and side panels of the medical shoe 8, 11, 12 are formed of a needle punched felt textile, with a thickness of

4mm being found to be particularly effective, and the sole and front are formed of EVA foam, again with a thickness of 4mm having been found to be particularly effective.

For treatment of a hoof, the hoof is firstly thoroughly cleaned, before a medicinal paste is applied to the whole area of the sole of the hoof including the frog, having a composition comprising 95% to 99% Glycerine, 3 to 8 g/kg of *Lavendula angustifolia x latifolia*, 0.5 to 1.5 g/kg Arnica Montana and 1.5 to 10 g/kg *Melaleuca alternifolia*. It has been found to be particularly effective to use a composition comprising 99% Glycerine, 0.6% *Lavendula angustifolia x latifolia*, 0.1% Arnica Montana and 0.3 % *Melaleuca alternifolia*.

Once the paste has been applied, the shoe is then fitted and the straps tightened. The shoe is then taped over with an adhesive bandage to keep out any dirt. The shoe and dressing should then be changed every 24 hours or as directed by a Veterinary surgeon.